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## (54) PAN FLUTE

(71) We, ALAIN JEANJAQUOT, a French citizen of Chalet Kustner, 74560 Mornex, France, ANDRE SANTU, a French citizen of Chalet Kustner, 74560 Mornex, France and LILIANE MOGLIA, a Swiss citizen of 18, avenue Krieg, 1208 Geneva, Switzerland, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

The invention relates to panpipes or pan flutes composed of a series of hollow parallel pipes of graduated lengths having open upper ends which are aligned or substantially aligned and into which the player blows.

With instruments of this type a correct musical sound can only be obtained by a great skill of the player which notably involves a very precise orientation of his wind into the pipes, and this can only be acquired by long practice.

Moreover, such instruments are usually definitely tuned during manufacture and the notes obtained can only be varied by virtuoso players. In this respect, the pan flute thus differs fundamentally from other open-pipe wind instruments such as the trumpet, clarinette and the usual flute.

Moreover, the chromatic (or diatonic) range can only be approximately achieved by virtuoso panpipe players, the usual panpipes only enabling two or three notes to be played simultaneously.

In addition to the cited drawbacks, the difficulty of directing wind into the pipes makes it is practically impossible to play a panpipe mounted on a support carried by the player (as is currently done with harmonicas) to enable simultaneous playing of another instrument such as a guitar.

An aim of the invention is to provide an improvement in the panpipe or pan flute

which facilitates playing by beginners.

According to the invention, a pan flute comprises a wind-guide device fixed on the flute adjacent the upper ends of the pipes, said device having a series of orifices corresponding in number and position to the pipes, the orifices being accessible on one side to a player's lips and being disposed to direct air through the orifices with a constant orientation into the respective open ends of the pipes.

The principal advantage of such a device is that the player's wind is correctly guided into the pipe ends to facilitate the playing of a note, or several notes if several adjacent orifices are simultaneously blown into. As a result, the improved pan flute may be carried on a harmonica-type support enabling the player to simultaneously play another instrument.

According to another aspect of the invention, a pan flute comprises means for simultaneously, and in a repetitive manner, varying the effective length of vibrating air in each pipe, so as to enable the player to change the notes played, during playing.

An embodiment of the invention will be described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a schematic side elevational view of a pan flute with its wind-guide device in an operative position during playing;

Fig. 2 is a view similar to Fig. 1, but with the wind-guide device in a rest position;

Fig. 3 is a partly-cut away rear elevational view of the pan flute; and

Fig. 4 is a cut-away cross-sectional view through one pipe of a modified pan flute.

The illustrated pan flute comprises a series of hollow parallel pipes 4 of graduated length having open upper ends 3 with openings 4a into which the player

blows. The flute may, as illustrated, be flat, or the pipes may be disposed in arcuate configuration.

A wind-guide device is formed by a flat elongated piece 1 having a series of like orifices 2 corresponding in number and position to the number of pipes 4. This piece 1 is inclined to the pipes 4 so that each orifice 2 guides the player's wind along a chosen direction into the open upper end 4a of the respective pipe 4.

As shown in Fig. 4, each guide orifice 2 has a conical inner surface 2a, tapering towards the opening 4a. This surface could, however, be any "ruled" surface generated by a straight line, e.g. about a narrow circular opening 2b at the end directed towards the opening 4a, and another curved surface 2c (e.g. oval) at the accessible end of the orifice. The orifices 2 could for example be cylindrical, or have other tapering shapes, for example of oval section.

By carefully placing the wind-guide piece 1 and hence these guide orifices 2 just over the openings 4a, the player can, simply by blowing through any of the orifices obtain a correct sound without a need to very precisely place his lips.

The piece 1 is fixed on the pan flute by lateral plates 5, 6 and screws 7 enabling a setting both of the distance separating the piece 1 from openings 4a (i.e. generally longitudinally of the pipes 4), and the inclination of the guide orifices 2 to the open ends 3.

Further, as shown in Fig. 2, the wind-guide piece 1 may be moved to a rest position, adjacent one side of the open upper ends 3 of pipes 4, in which position the piece 1 serves as an abutment which can be placed in the hollow of the player's chin, just below his lower lip, to assist the player in guiding his wind directly into the openings 4a.

In an embodiment, not shown, the wind-guide piece includes adjustable means for partly obturating the guide orifices 2, to enable variation of the timbre of the sounds produced.

Moreover, the pipes 4 may be provided with a device for partly obturating them so that:

— for the same amount of blown air, the sound-emitting power of the flute is increased;

— by regulating the obturating surface, it is possible with the same pipe to obtain a note one octave higher.

The illustrated pan flute comprises means for simultaneously varying, in a reproducible manner, the effective length of vibrating air in each pipe. These means comprise a piston 8 movably mounted in the lower end of each pipe 4 (Fig. 4). Each

piston 8 is provided with a threaded rod 9 extending through the lower end of the pipe 4. The rods 9 are each screwed in an angularly-fixed nut 10 connected by a respective linkage rod 11 to a common bar 12 mounted for limited movement in two brackets 13 screwed on the end pipes 4 of the flute. A sliding guide 14a (Fig. 3) carrying rollers 15 and having a manually-accessible control button 14 cooperates with the bar 12 to raise or lower it in response to actuation of button 14. In the illustrated position, the rollers 15 are received in recesses in bar 12, and in another position, the rollers raise bar 12 and hence simultaneously raise all of the pistons 8, to enable a change by a half-tone during playing. Each rod 9 also has a slotted outer end enabling easy individual adjustment of the pistons 8.

The various improvements are particularly designed for teaching purposes, since they enable a beginner to rapidly learn to play the instrument. Without such aids, learning requires far more practice. Initially, the player may use the wind-guide as shown in Fig. 1. Later, the wind-guide can be lowered as shown in Fig. 2 to aid in correctly placing the lips relative to the pipe openings. Finally, the guide may be completely removed, while retaining the mobile-piston arrangement to obtain different chromatic ranges.

The modified pan flute of Fig. 4 has the piston-actuating device 11, 12, 13 disposed on the opposite side to that of the flute shown in Figs. 1 to 3.

As a modification, it is possible to provide a twin pan flute, i.e. with two series of pipes placed against one another, each series of pipes having a piston device enabling change by a half-tone, during playing. Such a twin flute could have a single wind guide with a number of orifices corresponding to the number of pipes of each series.

#### WHAT WE CLAIM IS:—

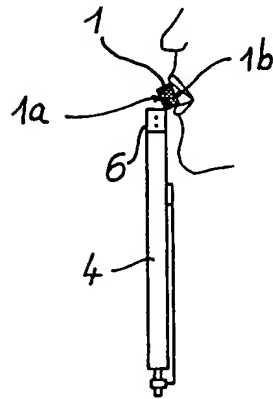
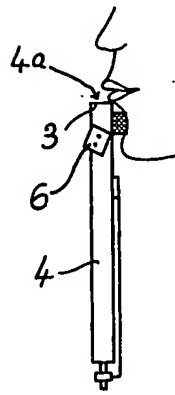
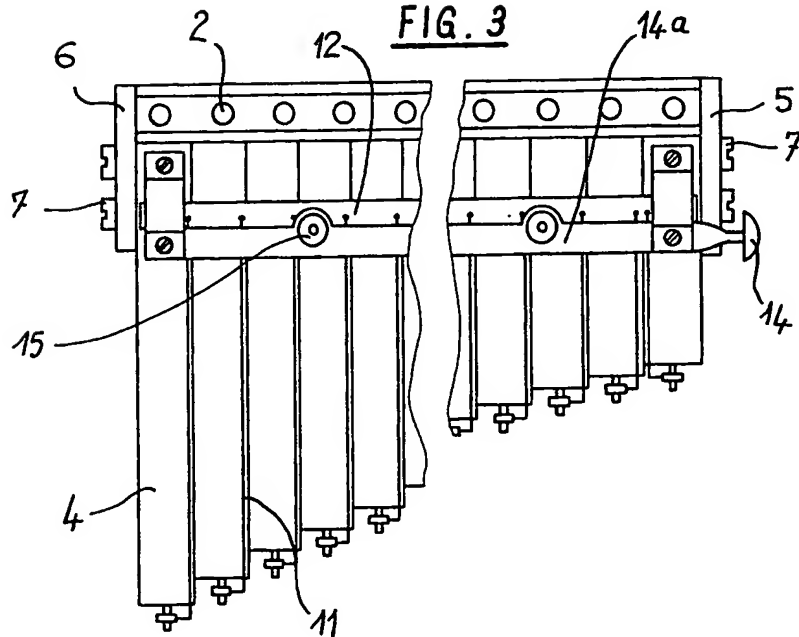
1. A pan flute comprising a series of hollow parallel pipes of graduated lengths and having open upper ends, and a wind-guide device fixed on the flute adjacent the upper ends of the pipes, said device having a series of orifices corresponding in number and position to the pipes, the orifices being accessible on one side to a player's lips and being disposed to direct air through the orifices with a constant orientation into the respective open ends of the pipes.

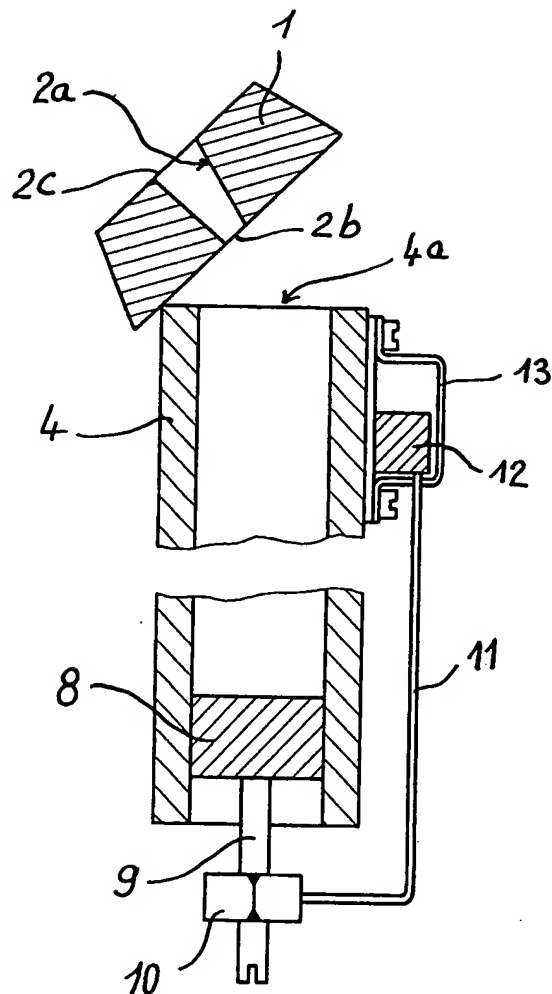
2. A pan flute according to claim 1, in which the wind-guide device is a flat elongated piece through the flat faces of which the series of orifices pass, said flat faces of the piece being inclined to the pipes.

3. A pan flute according to claim 1 or 130

- 2, in which each orifice has a curved opening at its accessible end and a circular opening at its other end, each orifice consisting of a surface generated by a straight line about said curved and circular openings.
4. A pan flute according to claim 1, 2 or 3, comprising means for adjustably mounting the wind-guide device on the flute.
5. A pan flute according to claim 4, comprising means for adjusting the position of the device along the longitudinal direction of the pipes.
6. A pan flute according to claim 4 or 5, comprising means for adjusting the angular position of the device to set the angle of incidence of the orifices to the open ends of the pipes.
7. A pan flute according to any preceding claim, comprising means for partly obturating the orifices of the device.
8. A pan flute according to any preceding claim, comprising means for simultaneously varying the effective length of each pipe.
9. A pan flute according to claim 8, comprising a piston mounted in each pipe on a threaded rod extending through the lower end of the pipe, each said rod being connected by a nut and a linkage to a common bar movable to simultaneously displace the pistons in the pipes.
10. A pan flute according to any preceding claim, in which the wind-guide device is movable to a rest position adjacent one side of the open upper ends of the pipes, in which rest position the device forms an abutment which can bear against the players chin recess under his lower lip.
11. A pan flute substantially as described with reference to the drawings.

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FIG. 1FIG. 2FIG. 3

FIG. 4